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What is claimed is:

1. Apparatus for determining priority of access to a bus among a set of devices coupled to the bus, each device being represented for priority purposes by a node in a group of nodes, each node being coupled to the bus and receiving a priority line from a first adjacent node and providing a priority line to a second adjacent node and having a priority relative to a single node with the highest priority, the priority determining apparatus comprising in each node:

P1

priority logic means for permitting access to the represented device if no higher priority node has requested access; and

P1

highest priority node specification means responsive to the bus for specifying whether the node is presently the highest priority node and, if the node is presently the highest priority node, dynamically giving the highest priority to another of the nodes in response to a predetermined number of accesses of the bus by one of the set of devices.

2. The apparatus set forth in claim 1 and wherein:

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the node has the lowest priority after the highest priority node specification means gives the highest priority to another of the nodes.

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3. The apparatus set forth in claim 1 and wherein:

the highest priority node specification means gives the highest priority to a node having the next highest priority.

~~4. The apparatus set forth in claim 1 and wherein:~~

~~the highest priority node specification means includes a counter means for counting a number of accesses to the bus and, responsive to a programmed value, gives the highest priority to another node on a next access by a node to the bus.~~

5. The apparatus set forth in claim 1 and wherein:

the group of nodes is configured as a circle for purposes of determining priority; and

the priority of a node is determined from the node's position in the circle relative to the highest priority node.

6. The apparatus as set forth in claim 5 and wherein:

the priority of the node is determined by the number of nodes between the node and the highest priority node in a preselected

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Claim 4 >

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P1

direction around the circle, with priority decreasing as the number of nodes increases.

7. The apparatus set forth in claim 6 and wherein:

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the highest priority node specification means gives the highest priority to the adjacent node in the direction of decreasing priority.

8. The apparatus set forth in claim 5 and wherein:

P1

the highest priority node specification means gives the highest priority to an adjacent node in the circle.

9. The apparatus set forth in claim 1 and wherein:

P1

the group of nodes is configured as a circle for purposes of determining priority;

P1

the priority logic means in each node includes preceding request value receiving means for receiving from the priority logic means of the immediately preceding node in a predetermined direction around the circle a request value which is in the alternative a first request value indicating that a preceding node beginning at the highest priority node has requested access to the bus

and a second request value indicating that no preceding node has requested access,

P1

preceding request value providing means for providing in the alternative the first or second request value to the priority logic means of the immediately succeeding node, and

P1

priority value receiving means for receiving from the highest priority node specification means a priority value which is in the alternative a first priority value indicating that the node has the highest priority and a second priority value indicating that the node does not have the highest priority; and

P1

the priority logic means operates responsively to the received request value, the received priority value, and any bus access request to respond to the absence of a bus access request and to any received request value by providing a request value equal to the received request value; respond to the presence of a bus access request and a received second request value by providing the first request value and permitting access to the bus,

P1

respond to the presence of a bus access request and a received first request value and the second priority value by providing the first request value without permitting access to the bus, and

respond to the presence of a bus access request, a received first request value and the first priority value by providing the first request value and permitting access to the bus.

10. The apparatus set forth in claim 9 and wherein:

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the highest priority node specification means includes preceding priority value receiving means for receiving the priority value specified by the immediately preceding node's highest priority node specification means,

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preceding priority value providing means for providing the priority value specified by the node's highest priority node specification means to the immediately following node, and

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PI

bus access signal receiving means connected to the bus for determining when an access of the bus by one of the nodes has occurred; and

PI

the highest priority node specification means sets the priority value to the priority value received on the preceding priority value receiving means when the bus access signal receiving means determines that an access of the bus has occurred.

11. Apparatus for determining priority of access to a bus among a set of devices coupled to the bus comprising:

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a group of nodes, each node representing a device and having a priority and being responsive to requests to access the bus from the represented device to provide access if no device represented by a node with higher priority has requested access;

P1

means for giving a single one of the nodes the highest priority;

P1

means for giving the highest priority to a different node in response to a predetermined number of accesses of the bus by a device; and

P1

means for determining the priority of each node relative to the highest priority node.

12. The apparatus set forth in claim 11 and wherein:

P1

the means for determining the priority of each node relative to the node currently having the highest priority is a circular configuration of the nodes wherein the priority of a given node is determined by the node's position relative to the highest priority node.

3

13. The apparatus set forth in claim 12 and wherein:

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the means for giving the highest priority to a different node gives the highest priority to an adjacent node in the circle.

14. The apparatus set forth in claim 13 and wherein:

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the priority of a given node in the circular configuration is determined by the number of nodes between the node and the highest priority node in a preselected direction around the circle, with priority decreasing as the number of nodes increases; and

P1

the means for giving the highest priority to a different node gives the highest priority to the adjacent node in the direction of decreasing priority.

15. A method for determining priority of access to a bus among a set of devices coupled to the bus, each device being represented for priority purposes by a node in a group of nodes and each node having a priority relative to a single node currently having the highest priority, the method comprising the steps of:

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receiving an access request in a node from a represented device;

P1  
determining whether any node with a higher priority has received an access request;

P1  
if no such node has received an access request, permitting the device to access the bus;

P1  
counting a number of accesses by the device to the bus; and

P1  
in response to predetermined number of accesses to the bus, giving another node the highest priority.

16. A method as set forth in claim 15 and including an initial step of providing a value indicating a predetermined number of accesses that the device may make to the bus.

17. A method as set forth in claim 16 wherein the step of providing is accomplished by loading a digital value into a presettable counter means.

18. A method as set forth in claim 17 wherein the step of counting includes a step of incrementing the presettable counter means for each access by the device to the bus.

19. A method as set forth in claim 18 wherein the step of giving another node the highest priority occurs when the presettable counter means generates a terminal count output.